Multiply the Matrices

$$\begin{bmatrix} -3 & 3 \\ 1 & 2 \end{bmatrix} \cdot \begin{bmatrix} 1 & 5 \\ -3 & -2 \end{bmatrix} = \begin{bmatrix} -3\cdot 1 + 3\cdot -3 & -3\cdot 5 + 3\cdot -2 \\ 1\cdot 1 + 2\cdot -3 & 1\cdot 5 + 2\cdot -2 \end{bmatrix}$$

$$= \begin{bmatrix} -3 + -9 & -15 + -6 \\ 1 + -6 & 5 + -4 \end{bmatrix}$$

$$= \begin{bmatrix} -12 & -21 \\ -5 & 1 \end{bmatrix}$$

Outcome: 10/13/08

Evaluate the determinant of matrices.

p 198 Example 4

Read the problem

* Sara Palin

$$\begin{array}{r|ccc} & \text{Sticks} & \text{Pucks} & \text{Uniforms} \\ \hline \text{Women's} & 14 & 30 & 18 \\ \text{Men's} & 16 & 25 & 20 \end{array}$$

row x column
$2 \times 3$

$$(2 \times \cancel{3})(\cancel{3} \times 1) = (2 \times 1)$$

$$\begin{array}{r|c} & \text{cost} \\ \hline \text{Sticks} & 60 \\ \text{puck} & 2 \\ \text{uniforms} & 35 \end{array}$$

2nd → Matrix ($x^{-1}$) → Edit → [A] → Enter
→ Make it a 2x3 → Enter values.

---

2nd → Matrix ($x^{-1}$) → Edit → [B] → Enter
→ 3 x 1 → enter values

[A][B]

Quit → 2nd Matrix → Names [A]
→ 2nd Matrix → Names [B]

[A][B] → enter

$$\begin{array}{r|c} & \text{Cost} \\ \hline \text{womens} & \$1530 \\ \text{men} & \$1710 \end{array}$$

#41 in your book pg. 201.

$$A = \begin{bmatrix} 21 & 16 \\ 40 & 33 \\ 15 & 19 \end{bmatrix} \qquad B = \begin{bmatrix} 650 & 825 & 1050 \end{bmatrix}$$

$3 \times 2$ $\qquad\qquad$ $1 \times 3$

AB

$(3 \times \cancel{2)(1} \times 3)$

BA $\quad (1 \times 2)$

$(1 \times 3)(3 \times 2)$

$[B][A] \quad 1 \times 2$

$$\begin{bmatrix} \$62{,}400 & \$57{,}575 \end{bmatrix}$$

Dealer A profits. Dealer B profit.

# Determinant of a Matrix

$\det(A)$ or $|A|$

$n \times n$ dimensions have to match

$2 \times 2$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

$$\det \begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$$

$\begin{bmatrix} 5 & 4 \\ 3 & 1 \end{bmatrix}$ find the determinant

$$\begin{vmatrix} 5 & 4 \\ 3 & 1 \end{vmatrix} = 5 \cdot 1 - 4 \cdot 3 = 5 - 12 = -7$$

↑ matrix A

Quit → 2nd Matrix → MATH → 1:det(

→ [A] ⇒ det([A]) = -7

3x3

$$\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix}$$

$$a \begin{vmatrix} e & f \\ h & i \end{vmatrix} - b \begin{vmatrix} d & f \\ g & i \end{vmatrix} + c \begin{vmatrix} d & e \\ g & h \end{vmatrix}$$

$$\boxed{a(ei - fh) - b(di - fg) + c(dh - eg)}$$

$$\begin{vmatrix} 2 & -1 & -3 \\ 4 & 1 & 0 \\ 3 & -4 & -2 \end{vmatrix} =$$